

COMPONENT MAINTENANCE

LATCH, VALVE AND MANIFOLD ASSEMBLY 802078 SERIES

35-21-72

Feb 1/78





RECORD OF REVISIONS

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LATCH, VALVE AND MANIFOLD ASSEMBLY INTRODUCTION

This manual establishes the proper maintenance procedures which shall be followed by user maintenance, overhaul and service personnel when performing any type of service on 802078 series Latch, Valve and Manifold Assemblies described herein.

It is the primary intent of this manual:

- a. To specify proper safety regulations to be followed during performance of service on oxygen equipment used in aviation applications.
- b. To establish proper sequence of operations to be performed on the defined equipment.
- c. To provide the user with the data necessary to properly maintain, check, test and repair the equipment.

The following WARNINGS are presented to inform the user of this manual of the requirements which shall be adhered to when performing service procedures on this equipment. Additional WARNINGS will be found in the procedural steps in the manual.

ANY SERVICE OR OVERHAUL PERFORMED ON THIS APPARATUS SHALL BE DONE ONLY BY THOSE FACILITIES EXPERIENCED IN, OR BY PERSONNEL KNOWLEDGE-ABLE IN AVIATION OXYGEN EQUIPMENT. IF NONE ARE KNOWN, CONTACT SCOTT AVIATION OR ITS DISTRIBUTORS FOR NAMES OF AUTHORIZED SERVICE CENTERS.

WARNING: ALL PROCEDURES DESCRIBED IN THIS MANUAL SHALL BE PERFORMED IN AN AREA FREE OF OIL, GREASE, FLAMMABLE SOLVENTS OR OTHER COMBUSTIBLE MATERIALS. SUCH MATERIALS, AS WELL AS DUST, LINT, AND FINE METAL FILINGS ARE ALL POTENTIAL COMBUSTIBLES WHICH MIGHT, WHEN EXPOSED TO OXYGEN UNDER PRESSURE IGNITE AND RESULT IN AN EXPLOSION AND/OR FIRE.



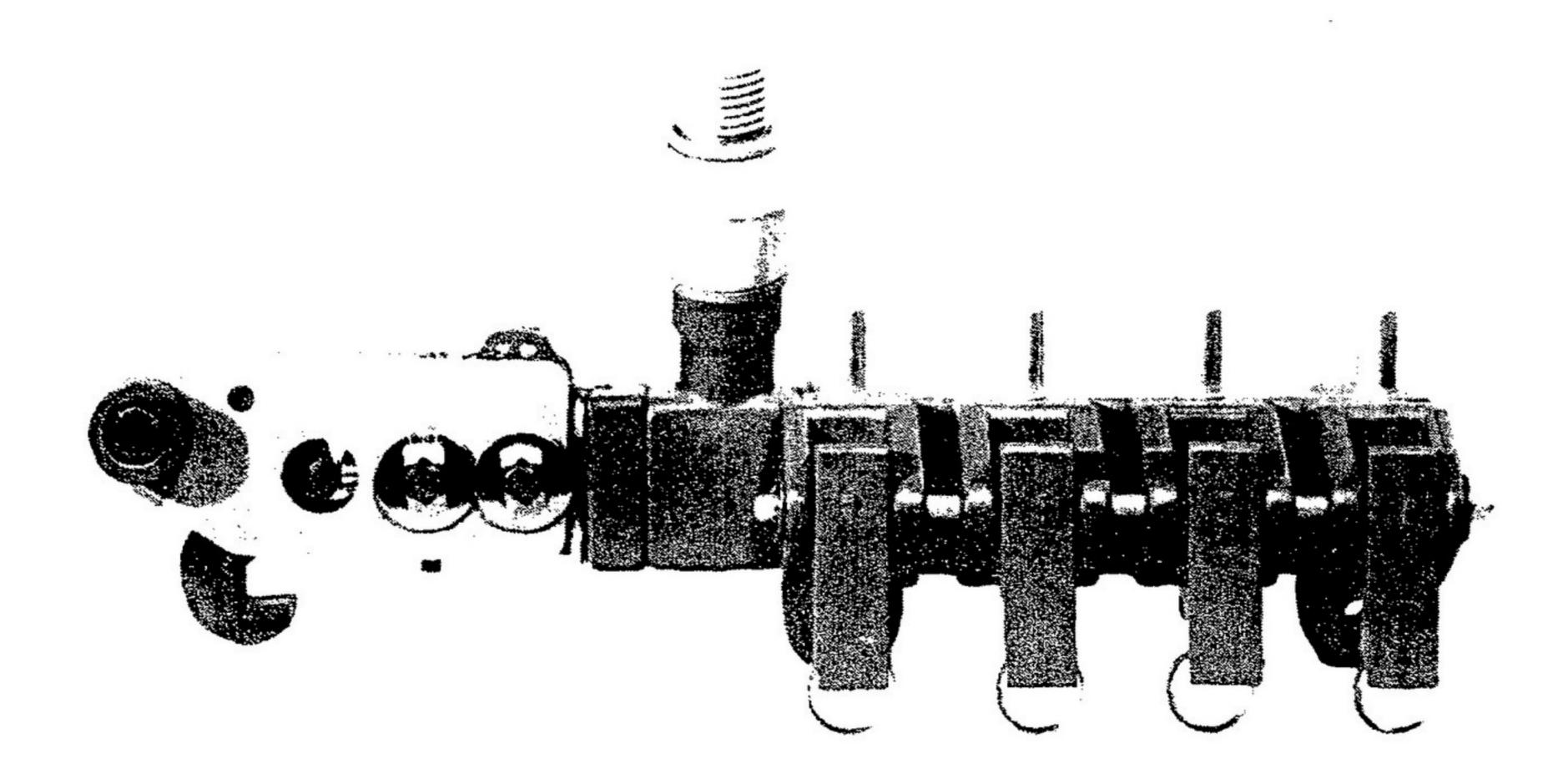
LATCH, VALVE AND MANIFOLD ASSEMBLY

1. Description and Operation

- A. Purpose of Equipment (see figure 1)
 - (1) To open the passenger service unit door after pressure has been applied to the assembly inlet.
 - (2) To supply and meter the flow of oxygen when a passenger opens an outlet by removal of a clip through a downward pull on a mask assembly.
 - (3) To engage and hold the passenger service unit door in the closed position when the door is so closed.

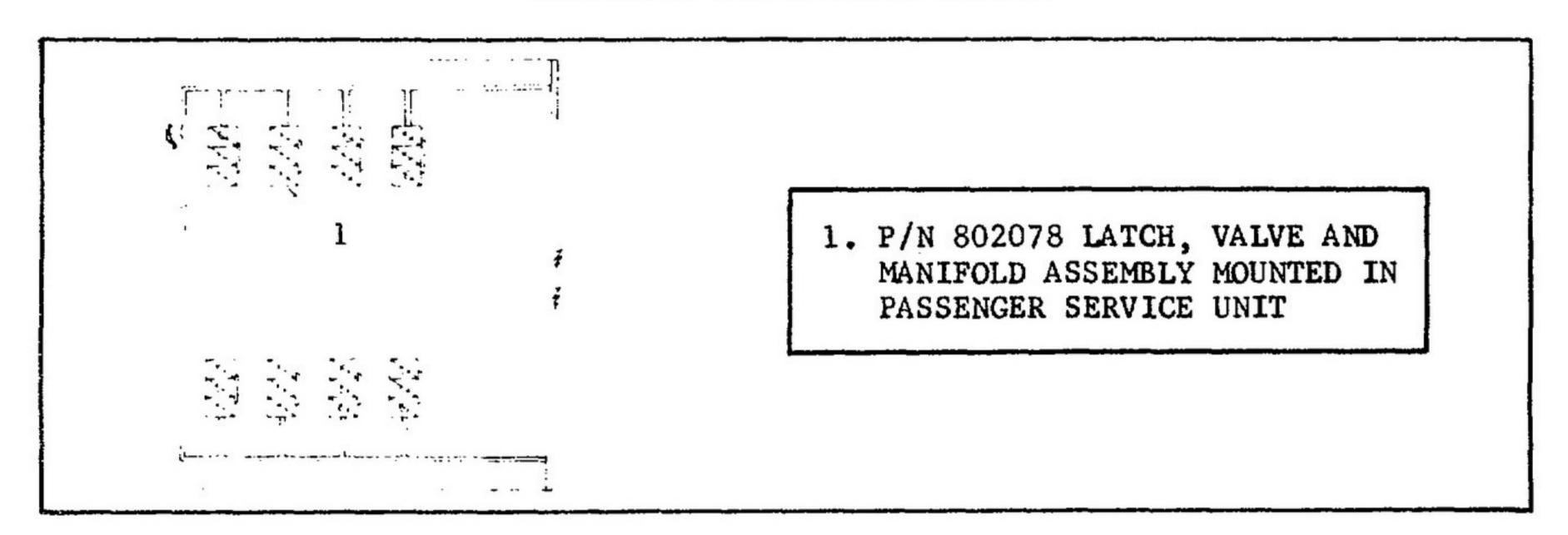
B. Typical Installation

 A typical pressurized cabin installation of the latch, valve and manifold assembly, hereinafter referred to as the assembly, is shown in figure 2. One assembly is installed in each passenger service unit.



802078 Series Latch, Valve and Manifold Assembly less Door Hook Assembly Figure 1





Typical Installation Figure 2

C. Operation

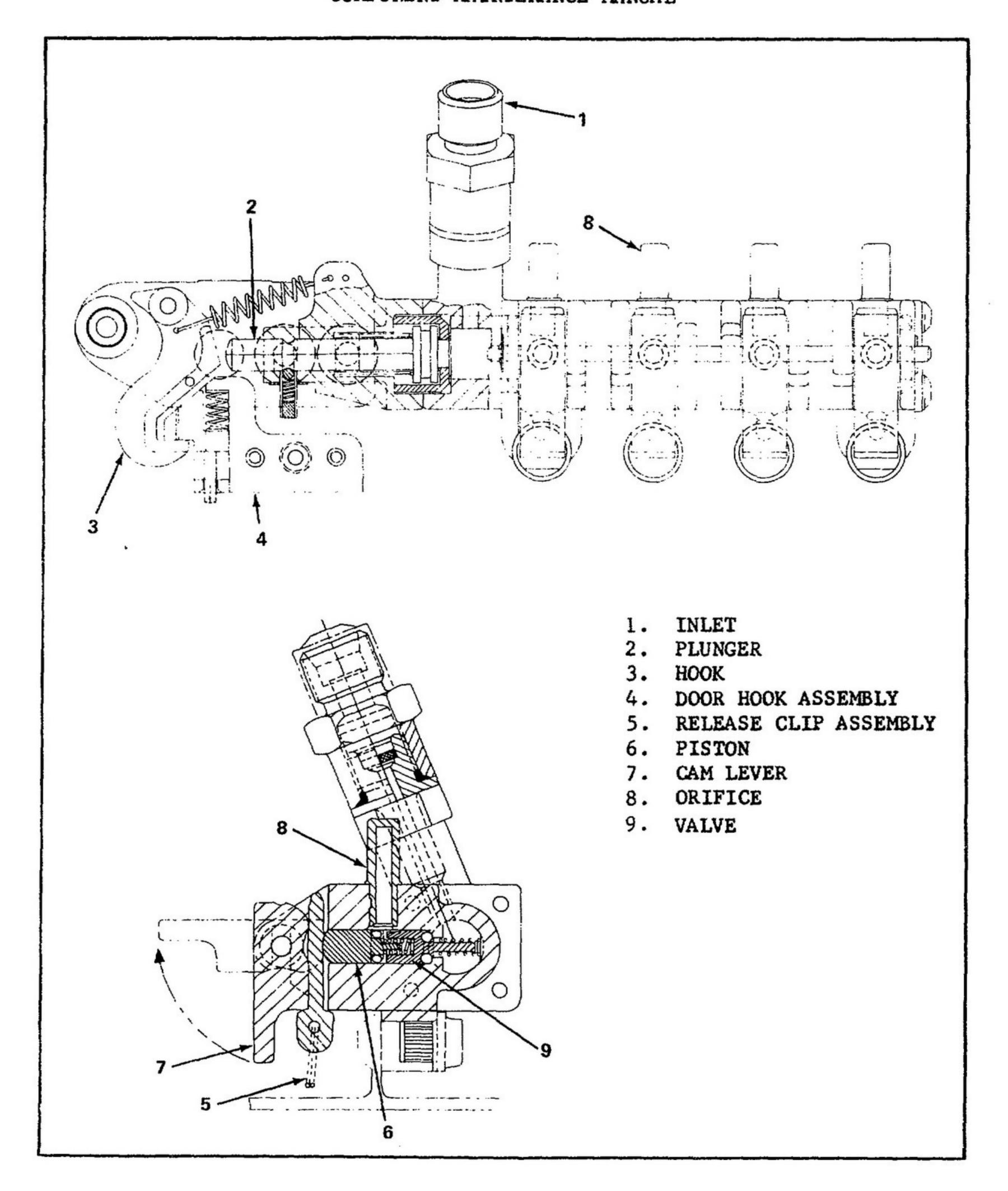
- (1) Operation of all assemblies is identical, with the only differences being right and left hand configuration with all normal flow valves or with three normal flow valves and one double flow valve.
- (2) The cross section illustrated in figure 3 is representative of all assemblies. With the assemblies installed in the passenger service unit, low pressure oxygen enters through inlet (1). Plunger (2) is moved against hook (3) disengaging the valve hook from door hook assembly (4), allowing the passenger service unit door to open and present mask assemblies to the passengers. Upon pulling on the mask assemblies, release clip assembly (5) is removed allowing spring actuated piston (6) to move forward into the recess in cam lever (7) thereby opening valve (9) and allowing oxygen flow into the mask. Flow through orifice (8) is shut off by manually rotating cam lever (7) up to the off position.

ASSEMBLY CHARACTERISTICS

1.	Weight
2.	Inlet Port AND 10050-5
3.	Inlet Fitting
4.	Automatic Opening Pressure Differential 20 psi +5 psi -2 psi
5.	Total (internal plus external) allowable leakage with 100 psig inlet pressure and shutoff valves closed

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802078 SERIES COMPONENT MAINTENANCE MANUAL



Typical 802078 Latch, Valve and Manifold Assembly Cross Section Figure 3

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2. Testing and Trouble Shooting

A. Testing

WARNING: IN ALL PROCEDURES LISTED BELOW, OXYGEN PER MIL-0-27210,
TYPE I IS SPECIFIED AS THE TEST GAS. NITROGEN PER
MIL-P-27401, TYPE I OR OIL-FREE AIR MAY BE SUBSTITUTED,
BUT RESULTS MUST BE CONVERTED PRIOR TO BEING COMPARED
WITH THE RESULTS SPECIFIED FOR OXYGEN. DO NOT, UNDER
ANY CIRCUMSTANCES, USE OIL PUMPED GAS AS THIS WILL CAUSE
CONTAMINATION OF THE ASSEMBLY AND TEST EQUIPMENT. OIL,
EVEN IN MINUTE QUANTITY, COMING IN CONTACT WITH OXYGEN
MAY CAUSE AN EXPLOSION OR FIRE.

- (1) Perform an Operational Test on the assembly using the following procedure.
 - (a) With no pressure applied to the assembly, manually operate the latch hook and cam levers a number of times. They shall operate freely to the limits of their travel without binding or exhibiting any signs of manfunction.
- (2) Perform an Internal and External Leakage Test in accordance with the following procedure.
 - (a) Insert a release clip under each cam lever and connect PVC or equivalent tubing to the outlet fittings.
 - (b) Slowly raise test gas pressure applied to the assembly inlet to 100 psig at a rate of 5 to 10 psi per second.
 - (c) Submerge the tubing ends under one inch of water for three minutes and measure internal leakage through the outlets for one minute.
 - (d) Submerge the assembly under one inch of water and measure the external leakage for one minute.
 - NOTE: Entrapped air released during submersion does not constitute leakage and there shall be no actuation of the plunger and/or toggles while the assembly is submerged.
 - (e) The sum of the leakages measured in steps (c) and (d) above shall not exceed 3 cc/min.
 - (f) Remove unit from water and relieve test gas pressure.



- (3) Perform a Release Clip Actuation Force Test in accordance with the following procedure.
 - (a) Apply a pressure of 100 psig to the assembly inlet.
 - (b) Attach a standard pull scale to one clip assembly (55, IPL figure 1) and pull the clip assembly free of the unit.
 - (c) Pull force, as measured on the pull scale, shall not be less than 1 lb. (4.448 Newtons) nor more than 4 lbs. (17.792 Newtons).
 - (d) After removing the release clip assemblies, manually open and close each lever (60, 65 or 70, figure 1) five times. There shall be no evidence of sticking or binding.
 - (e) Place all levers in the No-Flow (Up) position.
- (4) Perform an Automatic Latch Opening Test using the following procedure.
 - (a) Mount the assembly in an appropriate holding fixture.
 - (b) Apply pressure to the assembly at a rate of 5 to 10 psi per second.
 - (c) Adjust setscrew (40, IPL figure 1) so that the pressure required to actuate the valve hook to full travel is between 18-22 psig.
 - NOTE: Repeated adjustments may be required to achieve the required actuating pressure.
 - (d) Relieve inlet pressure.
 - (e) Actuate the assembly as described in step (b) above four additional times to verify actuation pressure setting.
- (5) Perform a Flow Rate Test in accordance with Table 201 and the following procedure.
 - (a) With levers (60, 65 or 70, IPL, figure 1) in the No-Flow (Up) position apply the inlet pressures listed in Table 201.
 - (b) Manually place each lever in the Flow (Down) position and measure the flow at each outlet.



(c) Measured flows shall be within the ranges shown in Table 201.

INLET	FLOW - LP	M (NTPD)	
PRESSURE	-00,-01,-02,-03 ASSYS	-02,-03 ASSYS	
(PSIA)	SINGLE FLOW OUTLET	DOUBLE FLOW OUTLETS	
34.7	2.98 - 3.40	5.92 - 6.88	
65.7	5.52 - 6.30	10.92 - 12.68	

Flow Rate Test Values Table 201

B. Trouble Shooting

(1) See figure 201 for a chart containing troubles, probable causes and corrective action.

	TROUBLE		PR	OBABLE CAUSE	CORRECTIVE ACTION
A. Internal and External Leal			kage		
	(1)	Leakage in excess of 3 cc/min. with assembly shut off,	(a)	Faulty or missing packings (90 or 105, IPL figure 1).	Replace or install packings.
			(b)	Defective or miss- ing spring (95).	Replace or install spring.
			(c)	Faulty or missing piston (85),	Replace or install piston.
			(d)	Faulty or missing retainer (100).	Replace or install retainer.
			(e)	Defective lever (60, 65 or 70).	Replace lever.
			(f)	Cracked body.	Replace entire assembly.
			(g)	Damaged internal seals in body.	Replace entire assembly.

Trouble Shooting Chart (Sheet 1 of 2) Figure 201



	TROU	BLE	PRO	BABLE CAUSE	CORRECTIVE ACTION
В.	Oper	ation			
	(1)	Hook (35, IPL figure 1) fails to return to latch position.	(a)	Defective or missing spring (15).	Replace or install spring.
	(2)	Pistons (85) fail to operate properly.	(a)	Packings (90 or 105) defective, missing or not properly lub-ricated.	Replace, install or apply proper lubri-cant.
			(b)	Defective or missing springs (95 or 115).	Replace or install springs.
C.	Automatic Latch Opening				
	(1)	Acutation pressure below 18 psig or above 25 psig.	(a)	Setscrew (40) not properly adjust.	Adjust setscrew to obtain proper actua-tion pressure.
D.	Rele	ase Clip Actuation E	orce		
	(1)	Force required to separate clip assemblies below	(a)	Defective spring (95 or 115).	Replace spring.
		l lb. or above 4 lbs.	(b)	Defective piston (85).	Replace piston.
			(c)	Defective clip assembly (55).	Replace clip assembly.
E.	F1ow	Rate			
	(1)	Out of tolerance flow for a given	(a)	Defective pack- ing (105).	Replace packing.
		inlet pressure.	(b)	Blocked orifice.	Replace assembly.

Trouble Shooting Chart (Sheet 2 of 2) Figure 201

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4. Disassembly

WARNING: DO NOT ALLOW OIL, GREASE, FLAMMABLE SOLVENTS, OR OTHER COMBUSTIBLE MATERIALS TO COME IN CONTACT WITH PARTS THAT WILL BE EXPOSED TO PRESSURIZED OXYGEN. SUCH MATERIALS, AS WELL AS DUST, LINT, AND FINE METAL FILINGS ARE ALL POTENTIAL COMBUSTIBLES WHICH MIGHT, WHEN EXPOSED TO OXYGEN UNDER PRESSURE, IGNITE AND RESULT IN AN EXPLOSION.

NOTE: See Testing and Trouble Shooting, to establish the condition of the assembly or most probable cause of its malfunction. This is to determine the extent of disassembly required without completely tearing down and rebuilding the component.

CAUTION: PARTS NOT REFERRED TO IN THIS PROCEDURE SHALL NOT BE DISASSEMBLED UNDER ANY CIRCUMSTANCES. THESE PARTS ARE CONSTRUCTED OF PLASTIC MATERIALS AND ASSEMBLED WITH SELFTAPPING SCREWS. REMOVAL AND RE-INSERTION MAY RESULT IN
LEAKAGE CONDITIONS WHICH CANNOT BE CORRECTED.

- A. Disassemble the assembly in accordance with IPL figure 1 and the following procedure.
 - (1) Unthread fitting (5) from the assembly; remove and discard packing (10).
 - (2) Disconnect spring (15) from the assembly body and from hook (35).
 - (3) Using a standard pliers, twist spacer (20) to loosen, then remove the spacer from its bushing.
 - (4) Using a pointed instrument, spread the prongs on nuts (30), remove and discard. Remove plates (25) and hook (35).
 - (5) Unthread setscrew (40) using a .050 hollow setscrew key, then remove spring (45) and ball (50).
 - (6) Pull clip assemblies (55) out of the assembly.
 - (7) Using a flat, thin instrument, pry nuts (75) off shaft (80). Push the shaft out of the assembly body to release levers (60 or 65 and 70). Discard nuts (75).
 - (8) Pull pistons (85) out of the assembly body and remove packings (90). Discard the packings.
 - (9) Remove springs (95) from piston cavities in the assembly body.



- (10) Remove retainer (100) with retainer (110) and packing (105) attached. Do not disassemble, refer to Check, step C.
- (11) Tip the assembly body slightly to allow springs (115) to slide out of the body.
- (12) If plate (120) is damaged and requires replacement, record the data stamped thereon on a separate piece of paper, then peel plate (120) off the body.
- (13) If hook assembly (125) is damaged, it should be replaced as a unit. Do not disassemble.



5. Cleaning

WARNING: DO NOT ALLOW OIL, GREASE, FLAMMABLE SOLVENTS, OR OTHER COM-BUSTIBLE MATERIALS TO COME IN CONTACT WITH PARTS THAT WILL BE EXPOSED TO PRESSURIZED OXYGEN. SUCH MATERIALS, AS WELL AS DUST, LINT, AND FINE METAL FILINGS ARE ALL POTENTIAL COM-BUSTIBLES WHICH MIGHT, WHEN EXPOSED TO OXYGEN UNDER PRESSURE, IGNITE AND RESULT IN AN EXPLOSION.

A. Using the material listed in Table 501, perform the cleaning procedures outlined in the following paragraphs.

MATERIAL	MATERIAL DESCRIPTION		REFER TO PARAGRAPH		
Trichloroethane	Trichloroethane 1,1,1 Trichloroethane (MIL-T-81533)		5.B. (1)		
*Refer to Illustr	*Refer to Illustrated Parts List, paragraph A.5 for Vendor's Code.				
NOTE: Equivalent	NOTE: Equivalent substitute may be used for the listed item.				

List of Cleaning Materials Table 501

- B. Metal parts which have been contaminated can be cleaned by the following method using the material listed in Table 401.
 - (1) Method A. Use a vapor degreasing method with stabilized 1,1,1 Trichloroethane. Blow clean and dry with a stream of clean, dry, oil-free air.
- C. Non-metallic parts such as plastic, silicone and rubber components may be cleaned by using an ultrasonic detergent and water cleaning system. Rinse parts in clean water and purge dry with clean dry, oil-free air before reassembly.



6. Check

- A. Carefully check the entire assembly body with a magnifying glass for cracks. Particular attention shall be given areas around spline nuts and self-tapping screw holes. Cracks in these areas will render the assembly inoperable, necessitating discarding of the assembly.
- B. Visually check all parts for cracks, damaged threads or other obvious damage.
- C. Carefully check retainer (100), packing (105) and retainer (110) while they are assembled with a magnifying glass or microscope. If any of the three components show evidence of damage, wear, cracks or distortion, they shall be replaced as a unit. Individual components shall not be replaced.



7. Repair

A. Repair of parts other than removing burrs and chasing threads is not recommended. If a part is in need of repair, replace the part.

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8. Assembly

WARNING:

DO NOT ALLOW OIL, GREASE, FLAMMABLE SOLVENTS, OR OTHER COM-BUSTIBLE MATERIALS TO COME IN CONTACT WITH PARTS THAT WILL BE EXPOSED TO PRESSURIZED OXYGEN. SUCH MATERIALS, AS WELL AS DUST, LINT, AND FINE METAL FILINGS ARE ALL POTENTIAL COM-BUSTIBLES WHICH MIGHT, WHEN EXPOSED TO OXYGEN UNDER PRESSURE, IGNITE AND RESULT IN AN EXPLOSION.

NOTE: Table 801 lists the consummable materials necessary for assembly.

MATERIAL	DESCRIPTION	MANUFACTURER*	REFER TO PARAGRAPH
Oxygen Lubricant	Krytox 240 AC	V18873	8.A (3) 8.A (5) 8.A (12)
Sealing Compound	Glyptal No. 1201	V05972	8.A (9)

NOTE: Equivalent substitutes may be used for the materials listed with the exception of the oxygen lubricant. No substitute is allowed for the oxygen lubricant.

*Refer to Illustrated Parts List, paragraph A.5 for Vendor's Code.

List of Consummable Materials for Assembly Table 801

- A. Assemble the assembly in accordance with IPL figure 1 and the following procedure.
 - (1) Insert hook assembly (125) in a clean plastic bag and seal to prevent contamination of the component. Set aside.
 - (2) If plate (120) was removed, insert the data recorded from the removed plate and install the new plate.

NOTE: A typewriter can be used to insert required data.

- (3) Install packings (90) on pistons (85) after sparingly applying a wipe coat of oxygen lubricant to the packings. Set these subassemblies aside.
- (4) Slide springs (115) into each of the assembly cavities.
- (5) Insert retainers (100), with packings (105) and retainers (110) installed, into each of the four cavities over springs (115) making sure that springs (115) are properly engaged on the stem of retainers (100).



NOTE: Sparingly apply a wipe coat of oxygen to packings (105) prior to installing retainers (100).

- (6) Insert springs (95) into retainers (100), then slide the pistons subassembled in step 4 above into each of the cavities. Make sure the stem of the piston properly engages the spring.
- (7) Position levers (60, 65 and 70) over the cavities in the assembly body. Secure the levers to the assembly with shaft (80) and nuts (75).
- (8) Slide one clip assembly (55) under each lever (60, 65 or 70), with the levers in the "down" position.
- (9) Insert ball (50) and spring (45) into the assembly body. Thread setscrew (40) into the body using a .050 setscrew key. Perform the test procedure delineated in Testing, step 4 prior to applying sealing compound to the threads of setscrew (40).

NOTE: Initially insert the setscrew for only two threads.

- (10) Attach plates (25) to the assembly with nuts (30), then spread the plates slightly and install hook (35).
- (11) Insert spring (15) ends into hook (35) and the hole in the raised portion of the assembly body.
- (12) Install packing (10) after sparingly applying a wipe coat of oxygen lubricant to the packing.
- (13) Thread fitting (5) onto the assembly inlet and torque per Table 901 using a standard torque wrench.
- (14) Perform the procedures delineated in Testing.
- B. Storage After Assembly
 - (1) Place the entire assembly, including hook assembly from step 8.A (1), in a polyethylene or equivalent bag properly sealed to prevent the ingress of contaminants.
 - (2) Store the assembly with proper identification noted on the exterior of the bag.



9. Fits and Clearances

A. Table 901 presents the torque values necessary to assemble the unit.

IPL FIG. and ITEM NO.	ITEM	TORQUE (NEWTON METERS)
1 - 5	Fitting	20 pound-inches (2, 20)

Table of Torque Values
Table 901



- 10. Special Tools, Fixtures and Equipment
 - A. There are no special tools, fixtures or equipment required to perform the procedures delineated in this manual.



11. Illustrated Parts List

A. Introduction

- (1) This Illustrated Parts List lists and describes the parts of the 802078 series Latch, Valve and Manifold Assembly. It consists of a parts list and a completely indexed drawing. The Latch, Valve and Manifold Assemblies are followed immediately by their component parts, properly indented thereunder, to show their relationship to the assemblies.
- (2) If neither the part number nor the nomenclature is known, the part can be found by comparison with the exploded view illustration. When located on the illustration, the item number will refer to the line in the Illustrated Parts List with the part number and the nomenclature.
- (3) The part numbers listed in the "PART NUMBER" column are Scott Aviation part numbers except standard parts, which are listed by "MS" part numbers.
- (4) When the quantity of a part is to be selected as required, the abbreviation AR will appear in the "UNITS PER ASSY" column.
- (5) A six place code following the description of a part indicates the manufacturer of that part. Standard parts and parts carried under Scott part numbers have no six place vendor code. The following list contains the codes, and names and addresses of manufacturers supplying items or articles for the breathing unit. This listing includes the vendor's codes presented in Tables 501 and 801.

VENDOR'S CODE

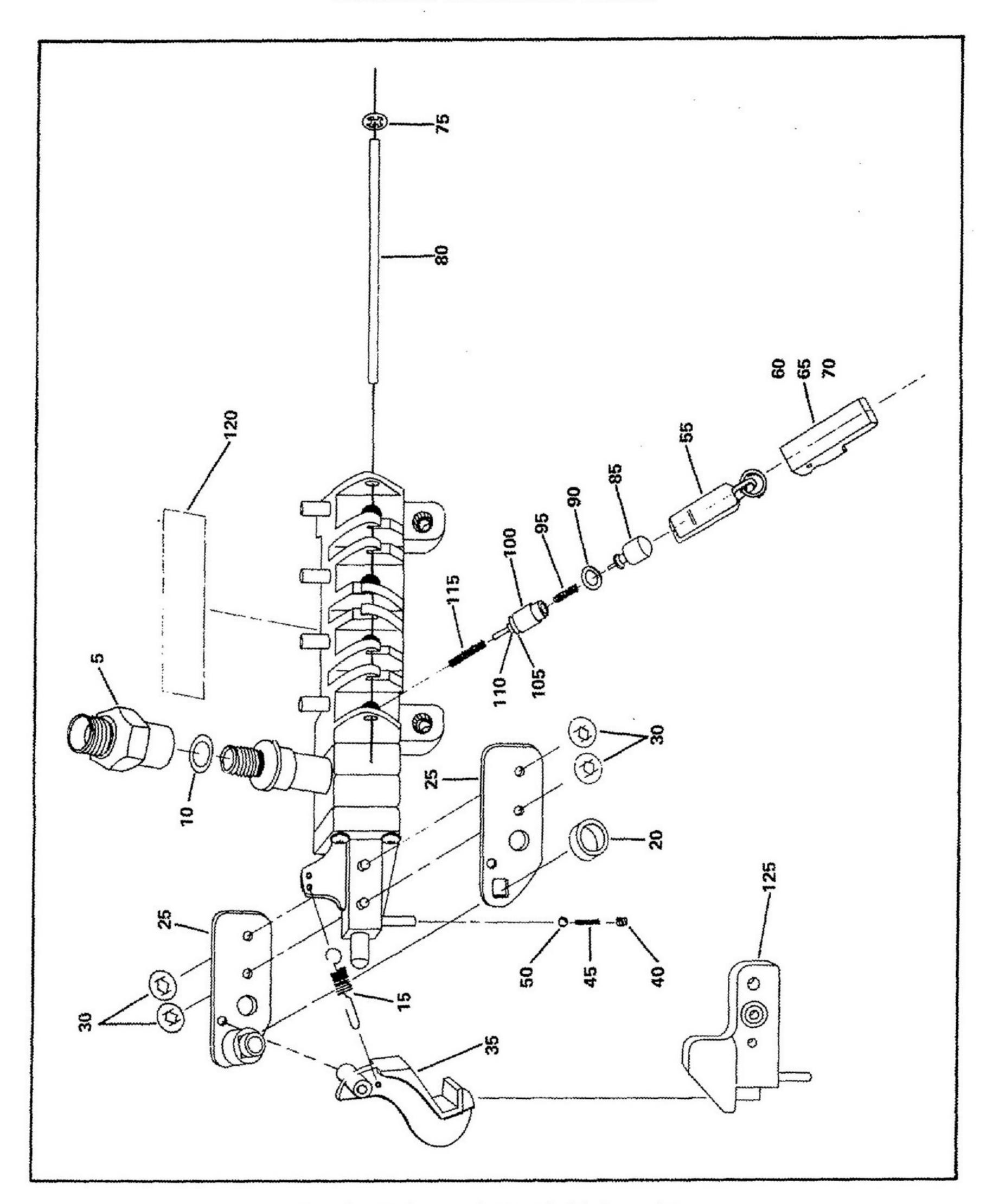
CODE	NAME AND ADDRESS
V05972	General Electric Silicone Products Business Dept. Waterford, Connecticut
V18873	E.I. DuPont De Namours Co., Inc. Wilmington, Delaware
V91784	Hooker Chemical Corp. Industrial Chemicals Division Niagara Falls, New York



(6) Parts used on only one part number Latch, Valve and Manifold Assembly are indicated by a letter symbol immediately following the description of a part in the "EFFECT CODE" column. An explanation of the letter symbols used is outlined below. In cases where the "EFFECT CODE" column has been left blank, parts listed are common to all assemblies.

PART NUMBER	EFFECT CODE
802078-00	A
802073-01	B
802078-02	. C
802078-03	D
802078-04	E





Latch, Valve and Manifold Assembly Figure 1

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802078 SERIES PROVISIONING PARTS BREAKDOWN

		PART	NOMENCLATURE		UNITS PER	
FIG. IT		NUMBER 802078-00	1 2 3 4 5 6 7		ASSY	
	-1A -1B -1C -1D 50 15 20 25 30 45 50 50 65 70	802078-00 802078-01 802078-02 802078-03 802078-04 10005041 NS9068-904 10005024 10005027 36562-00 10005032 33349-007 10005443 14213-00 802205-01 10005038 10005038 10005042	LATCH, VALVE & MANIFOLD ASSY . FITTING-ADAPTER . PACKING-PREFORMED . SPRING-EXTENSION . SPACER . PLATE-MOUNTING (ATTACHING PARTS) . NUT-SPEED* HOOK-LATCH . SETSCREW-HEADLESS . SPRING-DETENT . BALL-NYLON . CLIP ASSEMBLY-RELEASE . LEVER-CAM . LEVER-CAM . LEVER-CAM . LEVER-CAM (DOUBLE FLOW) (ATTACHING PARTS) . NUT-SPEED	A B C D E	RF RF RF 1 1 1 1 1 1 1 4 4 3 1 2	
1 1 1 1 1	85 90 95 100 105 110 115 120	10005070 MS9068-006 10005502 10005071 36637-00 10005072 10005196 10005088 802195-01	. NOT-SPEED . SHAFT* PISTON . PACKING-PREFORMED . SPRING-COMPRESSION . RETAINER . PACKING-PREFORMED . RETAINER-SPRING . SPRING-COMPRESSION . PLATE-IDENTIFICATION . HOOK ASSEMBLY-DOOR		1 444444411	
			ponents shall be installed as s s shall not be replaced. Orde			

⁻ ITEM NOT ILLUSTRATED